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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,859	04/13/2004	Ujjwal Manna	3095-011	2663
23429 7590 04/08/2008 LOWE HAUPTMAN HAM & BERNER, LLP 1700 DIAGONAL ROAD SUITE 300 ALEXANDRIA, VA 22314				
EXAMINER				
BOYER, RANDY				
ART UNIT		PAPER NUMBER		
1797				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/822,859

Applicant(s)

MANNA ET AL.

Examiner

RANDY BOYER

Art Unit

1797

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 14-17, 19 and 21-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-17, 19, and 21-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office Action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4 March 2008 has been entered.

Response to Amendment

2. Examiner acknowledges Applicant's response filed 4 March 2008 containing amendments to the claims and remarks.

3. Claims 1-12, 14-17, 19, and 21-26 are pending.

4. The previous rejections of claims 1-12, 14-17, and 19 under 35 U.S.C. 103(a) are maintained. Likewise, new claim 26 is rejected under 35 U.S.C. 103(a). The rejections follow.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-4, 9, 14, 17, 19, 21-23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable in view of Hantzer (US 2003/0062292).

9. With respect to claim 1, Hantzer discloses a process for preparing food grade solvents of naphtha range containing very low aromatics, the process comprising the steps of: (a) heating the naphtha range petroleum feed stock to 150°C (see Hantzer,

page 3, paragraph 27); (b) adding a stoichiometric hydrogen to the naphtha range petroleum feed stock at a pressure of about 34 bar (see Hantzer, page 3, paragraph 27); (c) passing the mixture of step (b) through a reactor having a nickel based catalyst (see Hantzer, pages 3-4, paragraph 31); and (d) recovering a food grade hydrocarbon solvent of naphtha range containing very low aromatics (see Hantzer, Abstract; and page 2, paragraph 13).

Hantzer does not disclose wherein the stoichiometric amount of hydrogen is added to the naphtha range petroleum feed at a pressure between about 5 to 30 bar.

However, Hantzer explains that the process of his invention is operable over a range of conditions consistent with the intended objectives of product quality (see Hantzer, page 4, paragraph 36). Furthermore, Hantzer explains that the process conditions of temperature and pressure are significantly mild compared to conventional hydroprocessing technology (see Hantzer, page 4, paragraph 36). Finally, Examiner notes that differences in process conditions will generally not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such conditions are critical (see MPEP § 2144.05 (II)(A) (citing *In re Aller*, 220 F.2d 454 (CCPA 1955))).

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to modify the process conditions of Hantzer to provide for a supply of hydrogen at a pressure between about 5 and 30 bar.

10. With respect to claim 2, Hantzer discloses wherein the feed is a raffinate resulting from the solvent treatment of a light to heavy neutral distillate oil (see Hantzer, page 2, paragraph 19).
11. With respect to claim 3, Hantzer discloses wherein the raffinate feed has a sulfur content less than 50 ppm (see Hantzer, Example 3).
12. With respect to claims 4 and 23, Hantzer discloses wherein the raffinate stream is obtained from a distillate fraction that has been extracted, thus implying a low aromatics content (see Hantzer, page 2, paragraph 19).
13. With respect to claim 9, Hantzer discloses wherein the catalyst is supported on a refractory metal oxide support (see Hantzer, pages 3-4, paragraph 31).
14. With respect to claim 14, Hantzer discloses wherein the product contains nil olefins, sulfur less than 1 ppm, and aromatics less than 20 ppm (see Hantzer, Table I).
15. With respect to claim 17, Hantzer discloses wherein the process is carried out under a hydrogen environment at 150°C and about 34 bar (see Hantzer, page 3, paragraph 27).
16. With respect to claim 19, Hantzer discloses wherein the catalyst is pre-reduced before loading into the reactor (see Hantzer, pages 3-4, paragraph 31).
17. With respect to claims 21 and 22, Hantzer discloses wherein the raffinate stream has sulfur content of 2.1 ppm (see Hantzer, Example 1). Moreover, Hantzer discloses wherein the raffinate stream may be any petroleum hydrocarbon fraction capable of yielding a product of the desired purity (i.e. having substantially no sulfur) (see Hantzer, page 2, paragraphs 18 and 19).

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18. With respect to claim 26, Hantzer discloses in paragraph 27 the addition of hydrogen treat gas rates from 500 to 10,000 scf/B (see Hantzer, page 3, paragraph 27). In this regard, Examiner understands "stoichiometric amount of hydrogen" to mean the minimum amount of hydrogen required to carry out the hydrogenation reaction. Thus, Examiner finds it to be of no consequence that Hantzer may use an amount of hydrogen in excess of a stoichiometric amount since the amount Hantzer uses will be *at least* a stoichiometric amount of hydrogen.

19. Claims 10-12, 15, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hantzer (US 2003/0062292) in view of Cody (US 6974535).

20. With respect to claims 10 and 24, Hantzer discloses a process for preparing food grade solvents of naphtha range containing very low aromatics, the process comprising the steps of: (a) heating the naphtha range petroleum feed stock to 150°C (see Hantzer, page 3, paragraph 27); (b) adding a stoichiometric amount of hydrogen to the naphtha range petroleum feed stock at a pressure of about 34 bar (see Hantzer, page 3, paragraph 27); (c) passing the mixture of step (b) through a reactor having a nickel based catalyst (see Hantzer, pages 3-4, paragraph 31); and (d) recovering a food grade hydrocarbon solvent of naphtha range containing very low aromatics (see Hantzer, Abstract; and page 2, paragraph 13); wherein the naphtha range petroleum feed is raffinate resulting from solvent treatment of a light to heavy neutral distillate oil (see Hantzer, page 2, paragraph 19).

Hantzer does not disclose wherein the stoichiometric amount of hydrogen is

added to the naphtha range petroleum feed at a pressure between about 5 to 30 bar or wherein the metal catalyst loading is in the range of 10-70% by weight.

However, Hantzer explains that the process his invention is operable over a range of conditions consistent with the intended objectives of product quality (see Hantzer, page 4, paragraph 36). Furthermore, Hantzer explains that the process conditions of temperature and pressure are significantly mild compared to conventional hydroprocessing technology (see Hantzer, page 4, paragraph 36). In this regard, Examiner notes that differences in process conditions will generally not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such conditions are critical (see MPEP § 2144.05 (II)(A) (citing *In re Aller*, 220 F.2d 454 (CCPA 1955)). In addition, Cody discloses a process for producing a lubricating oil basestock by selectively hydrotreating a raffinate from a solvent extraction zone with a catalyst containing a metal loading greater than 30% by weight (see Cody, column 5, line 27). Cody explains that the catalyst, which may be a nickel-based catalyst on a refractory metal oxide support (e.g. alumina) (see Cody, column 5, lines 19-31), is effective at reducing the concentration of polynuclear aromatic species present in the raffinate to very low levels (see Cody, column 9, lines 16-20).

Therefore, the person having ordinary skill in the art of processes for preparing polymer or food grade hydrocarbon solvents would have been motivated to modify the process conditions of Hantzer to (1) provide for a supply of hydrogen at a pressure between 5 and 30 bar, and (2) use a hydrotreating catalyst with nickel loading between

about 10% and 70% by weight (as taught by Cody) in order to effect a removal of aromatic species to a very low level.

Finally, the person having ordinary skill in the art of processes for preparing polymer or food grade hydrocarbon solvents would have had a reasonable expectation of success in modifying the process of Hantzer as described above because (1) Hantzer is not specifically limited to the process conditions disclosed or used in the Examples of his specification (see Hantzer, page 4, paragraph 36); and (2) both Hantzer and Cody are directed to processes for producing higher quality mineral oils having a reduced aromatics content.

21. With respect to claim 11, Cody discloses wherein the metal surface area is about $30 \text{ m}^2/\text{g}$ (see Cody, column 5, lines 27 and 65).
22. With respect to claim 12, Cody discloses wherein the physical surface area of the nickel-alumina catalyst is $100 \text{ m}^2/\text{g}$ and the pore volume of the catalyst is $0.25 \text{ cm}^3/\text{g}$ (see Cody, column 5, lines 64-66).
23. With respect to claims 15 and 25, Cody discloses wherein the feed is obtained from the solvent extraction zone of a vacuum or atmospheric distillation unit and of poor quality (see Cody, column 4, lines 25-39).
24. Claims 4-8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hantzer (US 2003/0062292) in view of Everett (US 5294327).
25. With respect to claim 4, Hantzer discloses a process for preparing food grade solvents of naphtha range containing very low aromatics, the process comprising the steps of: (a) heating the naphtha range petroleum feed to 150°C (see Hantzer, page 3,

paragraph 27); (b) adding a stoichiometric hydrogen to the naphtha range petroleum feed stock at a pressure of about 34 bar (see Hantzer, page 3, paragraph 27); (c) passing the mixture of step (b) through a reactor having a nickel based catalyst (see Hantzer, pages 3-4, paragraph 31); and (d) recovering a food grade hydrocarbon solvent of naphtha range containing very low aromatics (see Hantzer, Abstract; and page 2, paragraph 13).

Hantzer does not disclose wherein the stoichiometric amount of hydrogen is added to the naphtha range petroleum feed at a pressure between about 5 to 30 bar or wherein the feed has an aromatics content less than 20% by weight.

However, Hantzer explains that the process his invention is operable over a range of conditions consistent with the intended objectives of product quality (see Hantzer, page 4, paragraph 36). Furthermore, Hantzer explains that the process conditions of temperature and pressure are significantly mild compared to conventional hydroprocessing technology (see Hantzer, page 4, paragraph 36). In this regard, Examiner notes that differences in process conditions will generally not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such conditions are critical (see MPEP § 2144.05 (II)(A) (citing In re Aller, 220 F.2d 454 (CCPA 1955)). In addition, Everett discloses a process for the production of food grade quality solvents via the hydrogenation of a naphthenic distillate wherein the feed distillate contains about 15-25 % by weight of aromatic hydrocarbons (see Everett, column 2, lines 39-57).

Therefore, it would have been obvious to the person having ordinary skill in the art of processes for preparing polymer or food grade hydrocarbon solvents would have been motivated to modify the process conditions of Hantzer to (1) provide for a supply of hydrogen at a pressure between 5 and 30 bar, and (2) provide for use of a feed having an aromatics content of less than 20% by weight (as taught by Everett) in order to achieve a food grade quality mineral oil.

Finally, the person having ordinary skill in the art of processes for preparing polymer or food grade solvents would have had a reasonable expectation of success in modifying the process of Hantzer as described above because (1) Hantzer is not specifically limited to the process conditions disclosed or used in the Examples of his specification (see Hantzer, page 4, paragraph 36); and (2) both Hantzer and Everett are directed to processes for producing food grade quality mineral oils having a reduced aromatics content.

26. With respect to claims 5, 8, and 16, Everett discloses use of a naphthenic distillate feed having an aromatics content in the range of 15-25% by weight (see Everett, column 2, lines 56-57).

27. With respect to claims 6 and 7, Everett discloses use of a naphthenic distillate feed. Naphthas are known in the art to have boiling points in the range between about 40°C and 170°C.

Response to Arguments

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28. Applicant's arguments filed 4 March 2008 have been fully considered, but they are not persuasive.

29. Examiner understands Applicant's principal arguments to be:

- I. Examiner overlooks a key element of Applicant's process which specifies the product quality in terms of the actual aromatic content, i.e. 20 ppm.
- II. A person of ordinary skill in the art and having appreciation for Hantzer would not be able to arrive at Applicant's specified conditions for obtaining a food grade solvent having specifically less than 20 ppm aromatics.
- III. Applicant's process provides a very specific preferred temperature, in contrast to Hantzer who provides a broad range of operating temperature.
- IV. The process of Hantzer uses different stages and not a single reactor system.
- V. Examiner's reliance on In re Aller is not on point.
- VI. The position that what is known in a secondary reference would be transferred to the primary reference is insufficient to establish a *prima facie* case of obviousness in the absence of reasonable motivation.

30. With respect to Applicant's first argument, Examiner notes that only Applicant's claim 14 specifies wherein the polymer or food grade hydrocarbon solvents obtained contain less than 20 ppm benzene. Moreover, because Applicant's claim 14 defines the quality of the polymer or food grade hydrocarbon solvent obtained by the process of claim 1 rather than further defining or limiting the process *per se*, Examiner construes the claim as being essentially analogous to a product-by-process claim. Because Examiner finds the process of Applicant's claim 1 obvious in view of Hantzer, it follows

that the product Applicant seeks to specify in claim 14 would likewise be obvious in view of Hantzer. Moreover, Examiner submits that the UV absorbances listed for the products obtained in Hantzer's process (see Hantzer, Tables) would correspond to an aromatics concentration of less than 20 ppm.

31. With respect to Applicant's second and third arguments, Examiner again notes that only Applicant's claim 14 specifies wherein the polymer or food grade hydrocarbon solvents obtained contain less than 20 ppm benzene. Otherwise, Applicant's claim 1 merely specifies a polymer or food grade hydrocarbon solvent having "very low" aromatics.

With respect to process temperatures, Hantzer specifies a process temperature range of 150°C to 500°C which is overlapping with Applicant's claimed temperature range of 70°C to 180°C. Thus, Applicant's claimed temperature range is clearly overlapping with that disclosed by Hantzer for temperatures between 150°C and 180°C. In this regard, Examiner notes that in the case where the claimed ranges overlap ranges disclosed by the prior art, a *prima facie* case of obviousness exists. See § MPEP 2144.05(I).

With regard to process pressures, Hantzer discloses a lower range operating pressure of 3549 kPa (i.e. 35.49 bar) (see Hantzer, page 3, paragraph 27). Examiner notes that this pressure represents a difference of only about 18% from the upper limit claimed by Applicant in step (b) of claim 1. Moreover, because Applicant uses the word "about" to define the operating range of pressure, Examiner finds that Applicant's claimed pressure range will extend to some point beyond 30 bar such that the upper

limit of Applicant's pressure range will touch or overlap the lower limit operating pressure of Hantzer's process.

Furthermore, Examiner notes paragraph 36 of Hantzer wherein he explains "[t]he process of this invention is operable over a range of conditions consistent with the intended objectives . . . the conditions of temperature and pressure are significantly mild relative to conventional hydroprocessing technology . . .". Thus, Hantzer clearly suggests the use of mild processing conditions, i.e. processing at lower temperatures and pressures.

32. With respect to Applicant's fourth argument, Examiner notes that while Hantzer describes his process as having what appears to be four distinct stages, Hantzer also explains that the entire process can be carried out in a single process unit, and wherein the entire process could be carried out at the same temperature and pressure or with different sections being controlled separately such that different sections may have different process conditions (see Hantzer, page 4, paragraph 32).

33. With respect to Applicant's fifth argument, Examiner submits that the holding of the court in In re Aller, 220 F.2d 454 (CCPA 1955), is not limited to the specific facts of that case - i.e. only applicable to differences in concentration and temperature. Rather, Examiner reads In re Aller in a broader context to hold that minor differences in process conditions (i.e. including pressure) will generally not support the patentability of subject matter encompassed by the prior art unless there is evidence to indicate such conditions are critical. In this regard, Examiner notes that Applicant's claimed operating pressures are generally lower than those disclosed by Hantzer. However, as explained

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supra at paragraph 31, Applicant's use of the word "about" to define the pressure range would lead the person having ordinary skill in the art to find Applicant's maximum claimed pressure to fall at some point beyond 30 bar, thereby touching or overlapping the lower operating pressure disclosed by Hantzer. Such being the case, Examiner finds Applicant's claim 1 obvious in view of Hantzer inasmuch as the maximum claimed pressure would be expected to either touch or overlap with the lower operating pressures disclosed by Hantzer.

34. With respect to Applicant's sixth argument, such argument represents an incorrect statement of law inasmuch as it conflicts with the Court's ruling in KSR Int'l Co. v. Teleflex Inc., 82 USPQ.2d 1385 (U.S. 2007). Moreover, Examiner submits that the use Everett's distillate fraction is entirely compatible as the starting material for Hantzer's process because (1) Hantzer discloses wherein the charge stock is preferably a distillate fraction that has been extracted; (2) Hantzer is not otherwise specifically limited with respect to the aromatic content of the distillate fraction to be used as feed, i.e. any distillate fraction could conceivably be used as the starting material for Hantzer's process so long as the objectives of Hantzer are satisfied; and (3) Everett represents a process for producing an extracted distillate fraction such as that disclosed by Hantzer to be a preferable starting material.

35. As a final point, Examiner notes that he would be willing to reconsider the patentability of Applicant's claims should Applicant choose to amend claim 1 to either (1) further narrow the claimed operating pressure range; or (2) strike the word "about" as a modifier of the claimed operating pressure range, thereby foreclosing the possibility

for overlap of Applicant's claimed operating pressure range with the lower end of Hantzer's disclosed operating pressures.

Conclusion

36. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randy Boyer whose telephone number is (571) 272-7113. The examiner can normally be reached Monday through Friday from 10:00 A.M. to 7:00 P.M. (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola, can be reached at (571) 272-1444. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RPB

/Glenn A Caldarola/

Acting SPE of Art Unit 1797